

**NPS PROJECT SUMMARY SHEET****AWARD FISCAL YEAR:** 2008**PROJECT TITLE:** Roy Lake Watershed Assessment Project**NAME, ADDRESS, PHONE AND E-MAIL OF LEAD PROJECT SPONSOR:**

Day County Conservation District

600 East Hwy 12, Suite 1

Webster, South Dakota 57239

Phone: 605-345-4661 ext. 124 Fax: 605-345-3048 e-mail: [dennis.skadsen@sd.nacdn.net](mailto:dennis.skadsen@sd.nacdn.net)**PROJECT TYPE:** Watershed**PROJECT LOCATION:** Latitude 45° 42' 06"N Longitude 97° 26' 06"W**WATERSHED NAME:** Upper Big Sioux River Basin **HYDROLOGIC UNIT CODE (HUC):** 10160010**HIGH PRIORITY WATERSHED:** Yes**POLLUTANT TYPE:** TSI**UWA CATEGORY:****TMDL DEVELOPMENT:** Yes**TMDL IMPLEMENTATION:****TMDL PRIORITY (High, Medium, Low):** High**WATERBODY TYPES:** Lakes, Streams, and Wetlands**ECOREGION:** Northern Glaciated Plains**PROJECT CATEGORY:** Agricultural/Animal Feeding Operations**PROJECT FUNCTIONAL CATEGORY:****GROUNDWATER PROTECTION:** No**Total 319 Funds:** \$31,026.00**Local and State Match:** \$20,684.00**319 Funded Full Time Personnel:** 0.7**Total Project Cost:** \$57,710.00**GOAL:**

The goal of this project is to locate and document sources of non-point source pollutants in the watershed that may be impacting the water quality of Roy Lake. This project will produce TMDL targets and goals for Roy Lake. Restoration activities recommended by this study will be implemented as part of the Northeast Glacial Lakes Watershed Improvement and Protection Project.

**PROJECT DESCRIPTION:**

Roy Lake is a natural lake (2,054 acres) located in Marshall County. The watershed for Roy Lake is 9,614 acres. The major land use in the watershed is agricultural, primarily pasture and rangeland. Roy Lake is listed as a 303(d) waterbody in the 2006 South Dakota Integrated Report for Surface Water Quality Assessment, impaired or threatened requiring a TMDL. Through in-lake and tributary water quality monitoring, stream gauging, and land-use analysis, sources of impairments will be documented and recommendations for restoration will be presented in a final project report.

## **2.0 STATEMENT OF NEED**

### **2.1**

The purpose of this assessment is to determine the sources of water quality impairments to Roy Lake in Marshall County, South Dakota. Roy Lake is listed in the 2006 South Dakota Integrated Report for Surface Water Quality Assessment as impaired requiring a TMDL. The current TSI value for this lake is higher than the reference sites for the comparable ecoregion.

Beneficial uses assigned to Roy Lake, current Trophic State Indexes (TSI), 303 (d) listing, and reasons for impairment are listed below.

<b>Waterbody:</b>	Roy Lake
<b>Mean TSI:</b>	59.5 (Secchi/Chlorophyll <i>a</i> )
<b>TMDL Status:</b>	water impaired/requires a completed TMDL
<b>303 (d) Listed:</b>	yes (2006)
<b>Beneficial Uses:</b>	
(4) Warmwater permanent fish life propagation:	<i>non-support due to TSI</i>
(7) Immersion recreation:	full support
(8) Limited contact recreation:	full support
(9) Fish and wildlife propagation, recreation and stock watering	full support

### **2.2**

Roy Lake is an important water-based recreational destination. Boating, swimming, and fishing are the main recreational activities. There are two resorts and a State Park located on the lake that provides the public access. There are approximately 137 homes and cabins located along the lakes shoreline. A majority of the undeveloped shoreline is owned by the State of South Dakota.

Physical attributes of Roy Lake are listed below.

<b>Waterbody:</b>	Roy Lake
<b>Waterbody Type:</b>	Natural
<b>River Basin:</b>	Upper Big Sioux River Basin
<b>HUC #:</b>	10160010
<b>County:</b>	Marshall
<b>Longitude/Latitude:</b>	45°42'06"N 97°26'06"W
<b>Watershed Area (acres):</b>	9614
<b>Watershed to Lake Ratio:</b>	6/1
<b>Maximum Depth (feet):</b>	20.6
<b>Mean Depth (feet):</b>	10
<b>Surface Area (acres):</b>	2054
<b>Shoreline Length (miles):</b>	14.5

## 2.3

See watershed map, Figure 1, page 5.

## 2.4

The majority of the water bodies located in Marshall County lie atop high tableland early French explorers named the Coteau Des Prairie or Hill of the Prairies. The topography of the Coteau was formed by the stagnation of glacial ice during the Late Wisconsin Glaciations that occurred approximately 12,000 years ago. As the glacier stagnated and began to fragment and melt, large blocks of ice were buried in melt water outwash. Melting of the ice blocks left depressions in the outwash of various size and depth. These depressions are the thousands of potholes, sloughs, and lakes characteristic of the modern day topography of the Coteau Des Prairie.

Roy Lake is positioned in the lower reaches of the Coteau Lake Outwash Deposit. This outwash deposit was formed during the Late Wisconsin Glaciations and was a tributary of the Big Sioux River drainage during the glaciers retreat. Roy Lake is connected to several other lakes through subsurface aquifers and surface drainages that lie in this deposit; these include Bullhead Lake, Four Mile Lake, Clear Lake, and Cottonwood Lake (Figure 1). All of these lakes drain to Roy Lake surficially through short intermittent tributaries between each lake following spring snowmelts or heavy rains. Roy Lake discharges through a surface outlet to Lost Lake that eventually drains into the Cattail and Kettle Lakes system

The major soil associations found in the project area include:

- Maddock-Serden, Embden-Hecla-Ulen, Beotia-Great Bend, and Harmony-Aberdeen-Exline - excessively drained to somewhat poorly drained soils formed in lacustrine materials on glacial lake plains
- Kranzburg, Forman-Poinsett, and Sinai-Poinsett - well-drained soils formed in loess on upland
- Forman-Aastad Buse, and Peever-Forman-Tonka - well-drained to poorly drained soils formed in glacial till on uplands
- Renshaw-Fordville-Sioux - well-drained to excessively drained soils formed in glacial outwash on uplands
- Dovray-Ludden-Lamoure - somewhat poorly drained to poorly drained soils formed in alluvium on bottom lands

Agriculture is the major land-use. Ownership and agricultural data for Marshall County are given in Table 1.

**Table 1. Land Ownership and Agricultural Data**

*Data from South Dakota Agricultural 2006 Bulletin No. 66	<b><u>Marshall</u></b>
Population (2002 census)*	4,576
Land Area* (Acres)	536,888
<b>Land Ownership</b>	
Private (Acres)	483,944
Tribal (Acres)	26,363
Federal (Acres)	11,180
State (Acres)	15,401
<b>Agricultural Data</b>	
Number of Farms*	529
Total Cropland* (Acres)	339,758
Corn/Soybeans* (Acres)	176,000
Small Grain* (Acres)	27,500
CRP (Acres)	55,629
Hay* (Acres)	39,000
Range/Pasture (Acres)	170,000
Livestock Numbers* (2002 census)	
Cattle	88,141
Swine	10,810
Sheep	3,644

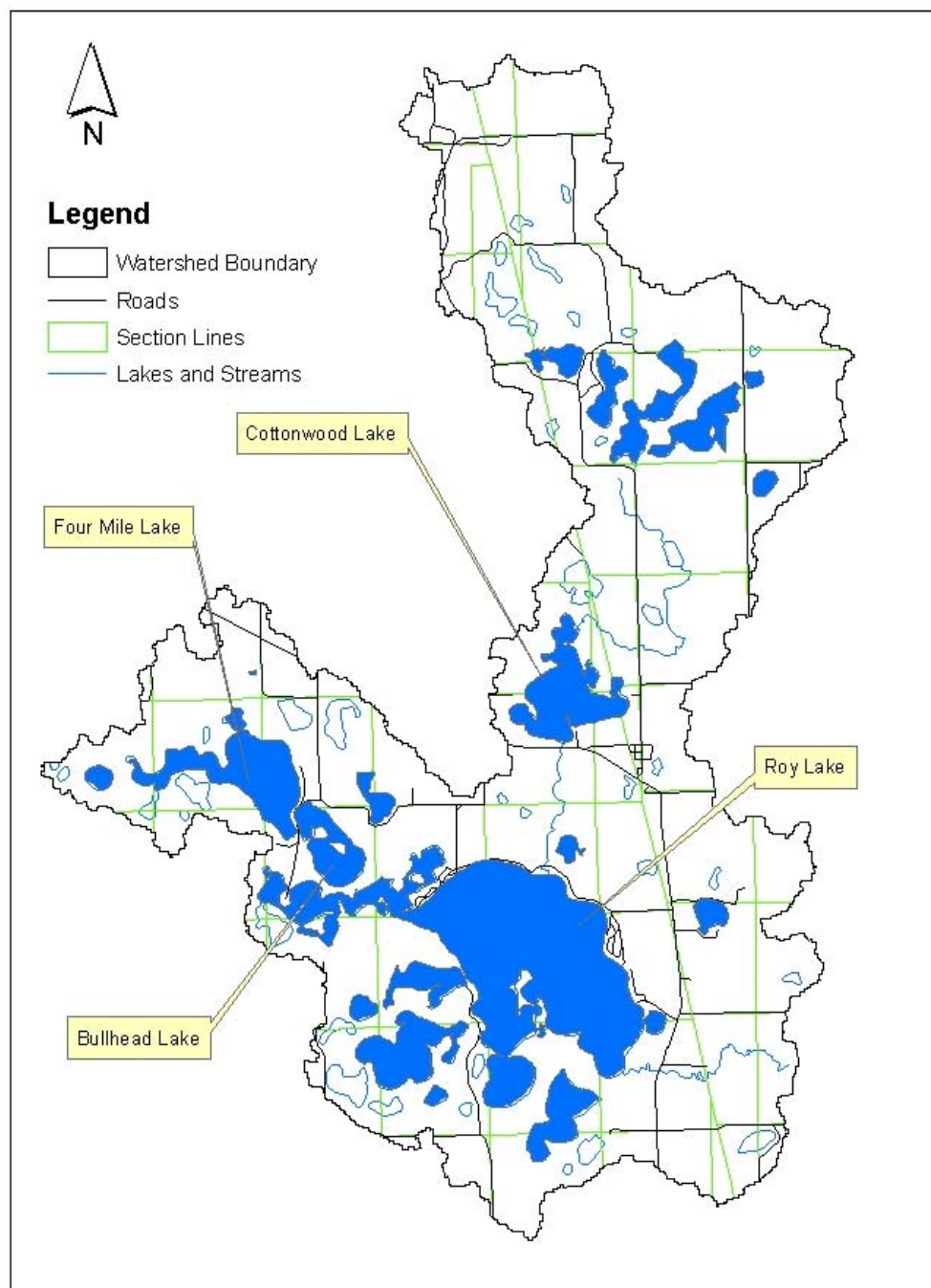
The climate of the project area is classified as Sub-humid Continental. Mean climatic conditions of the area are:

- Winter Average Daily Minimum Temperature - 4 degrees F
- Summer Average Daily Maximum Temperature - 82 degrees F
- Total Annual Precipitation - 21 inches
- Average Seasonal Snowfall - 31 inches

Approximately 75 percent (=16 inches) of the annual precipitation falls between the months of April to September. Tornadoes and severe thunderstorms occasionally strike. These storms, usually local and of short duration, occasionally produce heavy rainfall. (Data from Webster, SD reporting station)

## 2.5

The main non-point source pollutants affecting Roy Lake are suspected to be fecal-coliform bacteria, nutrients, and sediments carried by watershed runoff from surrounding cropland and animal feeding operations. There are no municipalities or point source discharges in the watershed.



**Figure 1. Roy Lake Watershed Map**

### **3.0 PROJECT DESCRIPTION**

#### **3.1 Goals**

The project will identify non-point source pollutants impairing the beneficial uses of Roy Lake.

The assessment project will produce a TMDL that will set goals for improving Roy Lake's TSI allowing all of its assigned beneficial uses to be met. Future implementation of best management practices in the watershed may be needed to reduce non-point source pollutants to meet the TMDL goal.

#### **3.2 Objectives and Tasks**

**Objective 1: Determine the probable sources and types of non-point source pollutants impairing the beneficial uses of Roy Lake.**

**Task 1: Collect in-lake water quality and biological data to identify the current Trophic State of Roy Lake.**

**Product: 1. In-Lake Water Quality Sampling**

Monthly water quality samples will be collected at two in-lake sites on Roy Lake (Figure 2), except during periods of unsafe ice conditions, and during the months of June, July, and August when bi-weekly samples will be collected. Discrete surface and bottom samples will be collected from both sites. Approximately 56 in-lake samples will be collected.

<u>Site</u>	<u>Location</u>	
RL01	Lat. 45.703900	Long. -97.443900
RL02	Lat. 45.691800	Long. -97.424000

The collection of all field water quality data will be accomplished in accordance with the "STANDARD OPERATING PROCEDURES FOR FIELD SAMPLERS" (SOP), SD DENR, June, 2003.

A list of in-lake water quality parameters to be collected is found in Section 5.2, on page 18 and 19.

**Milestones:**

Water Quality Samples	28 discrete surface samples
Water Quality Samples	28 discrete bottom samples

**Responsibility:**

Implementation	Project Coordinator Water Resources Institute
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Technical Assistance	SD DENR SD State Health Laboratory
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Financial Assistance	SD DENR Local Project Sponsors Water Resources Institute
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**Cost:**

Lab Fees - 56 samples x \$170.00 per sample = \$9,520.00  
Postage – 28 cartons x \$6.50 per carton = \$182.00  
Supplies (ice, shipping tape, DI water) = \$100.00

**Total Cost: \$9,802.00**

**319 Cost: \$5881.20**

**Fee Funds: \$3,920.80**

**Product: 2. Macrophyte/Shoreline Survey**

A macrophyte/shoreline survey will be completed to determine the species and coverage of macrophytes in Roy Lake, and the condition of the lakes shoreline habitat. The local coordinator will conduct the survey with assistance from the project officer. The procedures for the macrophyte survey can be found in the “STANDARD OPERATING PROCEDURES FOR FIELD SAMPLERS” (SOP), SD DENR, June, 2003. Based on Roy Lakes surface area, 40 shoreline transects will be needed

**Milestones:**

Completed Lake Habitat Assessment Field Data Sheets (40)

**Responsibility:**

Implementation	Project Coordinator Water Resources Institute
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Technical Assistance	SD DENR Water Resources Institute
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Financial Assistance	SD DENR Local Project Sponsors
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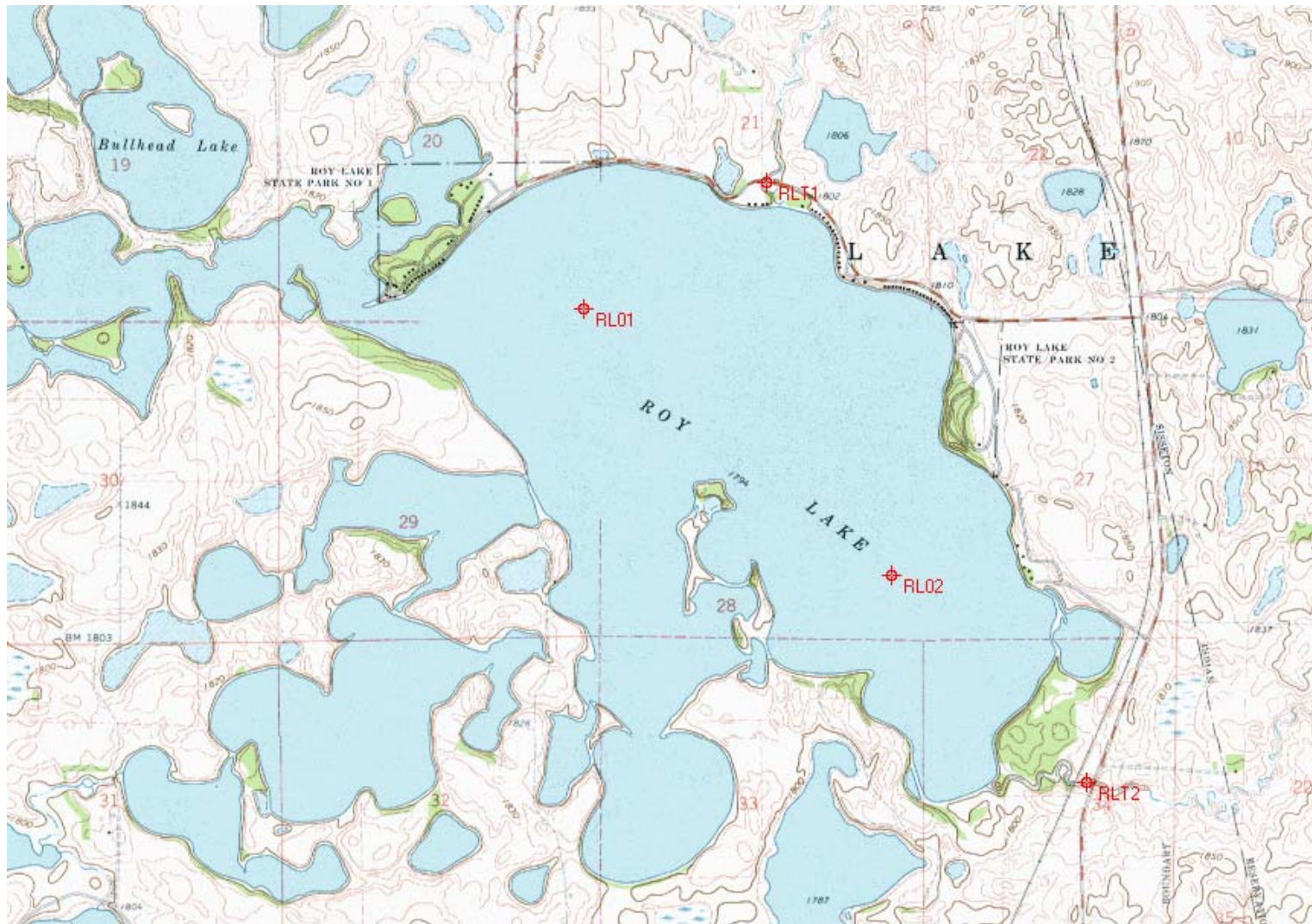
**Cost:**

Included in Administrative budget.

**Total Cost: \$0**

**319 Cost: \$0**





**Figure 2. Location of In-lake and Tributary Sampling Sites**



**Task 2:** Determine nutrient and sediment loadings to Roy Lake from the watershed through tributary water quality sampling data, stage and flow measurements.

**Product:** 3. Tributary stage and flow

Install stage recorders at two tributary sites (Figure 2). Tributary flows will be measured weekly beginning with ice-out and during rainstorm events using a hand-held current velocity meter. Flow measurements and tributary stage will be used to calculate a hydrologic budget for each tributary.

<u>Site</u>	<u>Location</u>	
RLT1	Lat. 45.709678	Long. -97.431659
RLT2	Lat. 45.682540	Long. -97.411112

<b>Milestone:</b>	Stage Recorder Installation Site RL02	1
	Stage Recorder Installation Site RL04	1
	Stage and Flow Measurements RL02	38
	Stage and Flow Measurements RL04	38

**Responsibility:**

Implementation	Project Coordinator SD DENR
Technical Assistance	SD DENR
Financial Assistance	SD DENR Local Project Sponsors

**Cost:**  
Included in Administrative budget.

**Product:** 4. Tributary Water Quality Sampling

Collect water quality samples from two tributary monitoring sites. Samples will be collected during spring runoff, storm events, and monthly base flows. Proposed water quality monitoring sites are shown in Figure 2. Samples will be collected twice weekly during the first week of spring snowmelt and once a week thereafter until runoff ceases. Base flows will be sampled monthly, and storm events will be sampled throughout the project period as they occur. Approximately 15 samples will be collected at each site for an estimated total number of 30 samples.

**Milestones:**

Monthly Samples	(7 per site)
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Spring Runoff Samples	(4 per site)
Storm Event Samples	(4 per site)

**Responsibility:**

Implementation	Project Coordinator
Technical Assistance	SD DENR SD State Health Laboratory
Financial Assistance	SD DENR Local Project Sponsors

**Cost:**

Lab Fees - 30 samples x \$170.00 per sample = \$5,100.00  
Postage – 15 cartons x \$6.50 per carton = \$97.50  
Supplies (ice, shipping tape, DI water) = \$55.00

**Total Cost: \$5,253.00**

**319 Cost: \$3,152.00**  
**Fee Funds: \$2,101.00**

**Task 3: Provide quality controls and assurances for all in-lake and tributary water quality data collected during the project.**

**Product: 5. Quality Assurance and Quality Control**

All QA/QC samples will be collected using the methods described in the “SOUTH DAKOTA NONPOINT SOURCE PROGRAM QUALITY ASSURANCE PROJECT PLAN” (QAPP), and the “STANDARD OPERATING PROCEDURES FOR FIELD SAMPLERS” (SOP), SD DENR, June, 2003. The activities involved with QA/QC procedures and the results of QA/QC monitoring will be compiled and reported in a section of the final project report.

The number of QA/QC samples is based on a minimum of 10 percent of all samples collected. For example, if the proposed number of in-lake samples (42) is collected for the project, approximately 4 blank and 4 field replicate QA/QC samples will be needed during the project.

**Milestones:**

In-lake Field Replicates	5
In-lake Blank Samples	5
Tributary Field Replicates	3
Tributary Blank Samples	3

**Responsibility:**

Implementation	Project Coordinator
Technical Assistance	SD DENR

SD State Health Laboratory

Financial Assistance

SD DENR

Local Project Sponsors

**Cost:**

Lab Fees -16 samples x \$170.00 per sample = \$2,720.00

Postage – 8 cartons x \$6.50 per carton = \$ 52.50

Supplies (ice, shipping tape, DI water) = \$ 28.00

**Total Cost: \$2,800.00**

**319 Cost: \$1,680.00**

**Fee Funds: \$1,120**

**Task 4: Evaluate Roy Lake's watershed to determine agricultural impacts to water quality through the use of the Annualized Agricultural Nonpoint Source (ANNAGNPS) model.**

**Product: 6. ANNAGNPS Land-use Model**

The Roy Lake watershed will be modeled using the ANNAGNPS model. ANNAGNPS is a comprehensive land use model that estimates sediment and nutrient loss and delivery, and evaluates the impacts of animal feeding operations (AFOs). The watershed will be divided into cells. Each cell will be analyzed after collecting several parameters for each cell with additional information collected for animal feeding operations.

The model will be used to identify critical areas of non-point source pollution to the surface waters in the watershed. If critical areas are found, the model will be used to determine attainable targets and goals for the TMDL.

**Milestones:**

Identify and collect data on animal feeding operations

Identify critical cells in the watershed

**Responsibility:**

Implementation

Project Coordinator

SD DENR

Technical Assistance

SD DENR

NRCS

Financial Assistance

SD DENR

Local Project Sponsors

**Cost:**

Included in Administrative budget.

**Objective 2:** Implement a public outreach program to inform project area stakeholders about the opportunities for involvement in, and progress of the project.

**Task 5:** Develop and implement a multimedia outreach program to promote the project, offer opportunities for involvement, and inform the public of project progress.

**Product:** 7. Direct personal contact with and involvement in project opportunities

Displays, public meetings, forums, and workshops will provide area residents a direct personal contact with the project and project involvement opportunities. Print material will be developed and distributed at these public events. The project or project partners will sponsor the following public meetings:

An informational meeting will be held for the general public prior to the assessments start to provide information on the objectives and goals of the assessment and provide an avenue for input from area residents.

Project information will be on display at the Britton Winter Festival Farm Show

A final meeting will be held while the watershed assessment final draft is nearing completion to get any last public input and comment into the report.

**Milestones:**

Pre-Assessment Meeting  
Britton Winter Festival Show  
Post Assessment Meeting

**Responsibility:**

Implementation:	Project Coordinator Local Project Sponsors
Technical Assistance:	Local Project Sponsors SD DENR
Financial Assistance:	SD DENR Local Project Sponsors

**Cost:**

Included in Administrative budget.

**Product: 8. Project web site**

A web site will be developed and funded by an EPA 319 grant for the Northeast Glacial Lakes Watershed Protection and Improvement Project. The web site will be maintained through a cooperative agreement with SDACD. Progress reports and information about the Roy Lake Watershed Assessment Project will be added to this web site.

**Milestones:**

Roy Lake Assessment Project Page	1
Number time's site accessed	15 (per month)

**Responsibility:**

Implementation:	Project Coordinator SDACD
Technical Assistance:	SD DENR SDACD
Financial Assistance:	319 Funds

**Cost:**

Included in Administrative budget.

**Product: 9. News Releases**

Print media will be used to inform the public about assessment activities.

**Milestones:**

New Articles 2 (1 pre-project, 1 post)  
(Participating partner newsletters; Britton newspapers)

**Responsibility:**

Implementation:	Project Coordinator Local Project Sponsors
Technical Assistance:	SD DENR Local Project Sponsors
Financial Assistance:	319 Funds Local Project Sponsors

**Cost:**

Included in Administrative budget.

### **Objective 3: Project Evaluation, Reporting, and Grant Administration**

#### **Task 5: Project Sponsor's Reporting Duties**

##### **Product: GRTS Reports**

Submitted electronically to SD DENR to meet reporting requirements for 319 funds. Reports will include information on project milestones completed and planned.

##### **Milestones:**

Semi-Annual Reports (GRTS)	2 (only if behind schedule)
Annual Reports (GRTS)	2

##### **Product: Monthly and Semi-Monthly Progress and Financial Reports**

Reports to be submitted to the project sponsor and co-sponsor. These reports will be submitted electronically or by attendance of the Project Coordinator at monthly board meetings.

##### **Milestones:**

Monthly Progress/Financial Reports	
Marshall Conservation District	9 (semi-monthly)
Day Co. Conservation District	19 (monthly)

##### **Product: Final Report**

Report will follow EPA format requirements and include the final status of all project milestones, final project budgets, water quality and ANNAGNPS data.

##### **Milestones:**

Final Project Report

##### **Product: Payment Vouchers**

Payment vouchers will be submitted not more than once per month utilizing the SD NPS Project Management System.

##### **Milestones:**

Payment Vouchers	16
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##### **Responsibility:**

Implementation:	Project Coordinator
Technical Assistance:	SD DENR Local Project Sponsors
Financial Assistance:	319 Funds Local Project Sponsors

**Cost:**  
Included in Administrative budget.

**Task 6: DENR's Reporting Duties**

**Product: GRTS Report**

The project officer will ensure all semi-annual and annual reports are sent to the GRTS reporting officer.

**Product: Final Report**

The department will be responsible for a final report for the Roy Lake Assessment Project, including;

- hydrologic, sediment, and nutrient budgets for the watershed,
- results of the ANNAGNPS modeling of watershed animal feeding operations, and identified critical areas in the watershed,
- recommendations for the development of an implementation project
- TMDL targets and goals

**Milestones:**

Semi-annual GRTS Report	1
Annual GRTS Report	1
TMDL	1
Final Report	1

**Responsibility:**

Implementation:	Project Officer SD DENR
Technical Assistance:	SD DENR EPA
Financial Assistance:	SD DENR

**Cost:**  
Included in Administrative budget.

**3.3 Milestones**

See attached milestone table, page 21.



### **3.4 Permits**

No special permits are required to complete this assessment project.

### **3.5 Lead Project Sponsor**

The Day County Conservation District is the project sponsor. The Day County Conservation District sponsored and completed two assessment projects and three implementation projects funded by EPA 319 grants. The project will be completed in cooperation with a co-sponsor, the Marshall Conservation District. The Marshall County Conservation District has also been involved in previous EPA 319 funded projects.

## **4.0 COORDINATION PLAN**

### **4.1 Participating Groups and Agencies**

The lead sponsor for this project is the Day County Conservation District. The district will administer and coordinate day-to-day work plan activities. The following groups/agencies have agreed through informal agreements to cooperate in the Roy Lake Watershed Assessment Project.

- **U.S. Environmental Protection Agency (EPA)** – Primary funding source for project (EPA Section 319 Grant). Region 8 EPA Officials will be invited to participate in project reviews, be provided access to project reports through GRTS, and approval of the final report and TMDL as submitted through SD DENR.
- **South Dakota Department of Environment and Natural Resources (SD DENR)** – Administer EPA Section 319 grant funds and provide oversight of all project activities. Project administration will include on-site office visits, watershed tours, review/initial approval of reports, and approval of payment requests for 319 funds.
- **Marshall County Conservation District** – Project partner/co-sponsor by MOU, local support and funding.
- **South Dakota State University, Water Resources Institute (WRI)** – Technical assistance.
- **South Dakota Association of Conservation Districts (SDACD)** – Technical assistance and website hosting.
- **James River Water Development District (JRWDD)** – Local support and funding.

- **Natural Resources Conservation Service (NRCS)** – Provide technical assistance for ANNAGNPS land-use modeling.

## **4.2 Local Support**

Development of this project is supported by the Day and Marshall County Conservation Districts. District Board of Supervisors composed of local landowners and agricultural producers have passed resolutions supporting this assessment project, and the larger multi-county Northeast Glacial Lakes Watershed Improvement and Protection project. Conservation District Board minutes and letters of commitment showing local support for the project have been forwarded to the SD DENR.

## **4.3 Coordination with Other Programs**

Through the Project Sponsor and Co-sponsor other programs that will enhance and further the goals of the project will be identified and coordinated with Section 319 funded activities.

These include but not limited to:

- Rapid Watershed Assessment Program (USDA NRCS)
- Project Coordinator training workshops (SD DENR)
- Technical training (USDA NRCS)
- South Dakota Nonpoint Source Information and Education Project
- South Dakota Citizen's Volunteer Lake Monitoring Program

## **4.4 Similar Activities in Watersheds**

This project will coincide with other EPA funded projects.

### **Northeast Glacial Lakes Watershed Improvement and Protection Project**

Watershed implementation and protection activities for several nearby lakes are currently being funded by an EPA 319 grant for the Northeast Glacial Lakes Watershed Improvement and Protection Project, a multi-year multi-segment project. The TMDL completed during this assessment will be addressed in future segments of the Northeast Glacial Lakes Watershed Protection and Improvement Project if needed.

### **South Dakota Nonpoint Source Information and Education Project**

Resources from this project, funded by a Section 319 grant to the South Dakota Discovery Center, will be used to enhance information and education efforts for this project. Anticipated uses of the projects assistance activities include training for volunteer lake monitors and water quality workshops for lake residents.

## **5.0 EVALUATION AND MONITORING PLAN**

### **5.1 Quality Control and Assurance**

Water quality sampling will be conducted in accordance with the EPA-approved “SOUTH DAKOTA NONPOINT SOURCE PROGRAM QUALITY ASSURANCE PROJECT PLAN” (QAPP), and the “STANDARD OPERATING PROCEDURES FOR FIELD SAMPLERS” (SOP), SD DENR, February 2005. Water quality analysis will be completed at the South Dakota State Health Laboratory located in Pierre, South Dakota. A minimum of 10 percent of all water quality samples collected will be quality assurance/quality control (QA/QC) samples. QA/QC samples will consist of field replicates and blank samples.

### **5.2 Monitoring Strategy**

Progress will be monitored based on completion of project objective and task milestones. Progress will be reported in mid-year and annual GRTS Reports; and semi-monthly and monthly reports to project sponsors. Local support and partner contributions will be tracked through records of time and financial contributions, and through attendance records at tours, informational meetings, and Project Coordinator presentations and contacts.

In-lake and tributary sampling of Roy Lake and its watershed will be undertaken to identify water quality impairments. The data will be used to identify BMPs needed to establish priorities for use during future implementation projects and subsequent segments as may be needed.

In-lake and tributary parameters to be measured in the laboratory include;

<b>Chemical</b>	<b>Biological</b>
Total Alkalinity	Fecal Coliform
Total Solids	E-coli
Total Suspended Solids	Chlorophyll <i>a</i>
Volatile Suspended Solids	
Ammonia	
Un-ionized Ammonia	
Nitrate-Nitrite	
Total Kjeldahl Nitrogen	
Total Phosphorus	
Total Dissolved Phosphorus	

Chemical and biological analysis for the above listed parameters will be completed at the South Dakota State Health Lab and SD DENR located in Pierre, SD.

Water quality parameters to be measured in the field by the local sampler include;

<b>Physical</b>	<b>Chemical</b>	<b>Biological</b>
Air temperature	Dissolved oxygen	Aquatic macrophytes
Water temperature	Field pH	
Secchi depth		
Water depth		
Stream stage		
Stream flow		
Visual observations		
Precipitation		

### **5.3 Data**

The Project Sponsor will be responsible for collecting, storing, and managing data collected during this assessment project. Appropriate data sheets and journals will be used. Data collected through in-lake water sampling will be forwarded to SD DENR in the appropriate format for entry into the STORET database.

### **5.4 Models**

The following models will be used to determine critical areas in the watershed.

- Assessment of land-use and animal feeding operations for loading. AnnAGNPS will be used.
- Sheet, rill, and gully erosion formulas for soil loss and transport. RUSLE 2 will be used.
- Step-L model for changes in loadings resulting from post assessment BMP installation.

The Project Sponsor will consult with SD DENR and NRCS for technical assistance and training on which models to use and how to properly use them.

## **6.0 BUDGET**

<b>Funding Sources</b>	<b>Year</b>		
	2008	2009	<b>TOTAL</b>
EPA Section 319 Funds	\$7,817.40	\$23,208.60	\$31,026.00
State of South Dakota Fee Funds	\$5,211.60	\$15,472.40	\$20,684.00
	\$13,029.00	\$38,681.00	<b>\$51,710.00</b>
<b>Total Budget</b>			

Part 2 funding located on page 22.

## **7.0 PUBLIC INVOLVEMENT**

Landowners and the public at-large will be informed through the Northeast Glacial Lakes Watershed Protection and Improvement Project's web site, articles in existing agency newsletters, fact sheets, watershed tours, news releases to radio, television, and print media outlets, and local events like Farm, Home, and Sports Shows.

## **8.0 THREATENED AND ENDANGERED SPECIES**

The U.S. Fish and Wildlife Service list the western prairie fringed orchid, bald eagle, whooping crane, and piping plover as species that could potentially be found in the project area. Bald eagle nests have been documented near project watersheds, however, the Bald eagle and other listed species are not likely to be impacted by the assessment work of this project.

3.3 Milestone Table		Quantity		2008		2008	2009
Objective/Task				Jan-Apr	May-Aug	Sept-Dec	Jan-Mar
Objective 1.							
Product 1. In-Lake Water Quality Sampling							
Discrete Surface Samples		28	8	14	6		
Discrete Bottom Samples		28	8	14	6		
Product 2. Macrophyte/Shoreline Survey		1		1			
Product 3. Tributary Stage and Flow							
Install Sites							
Stage and Flow Measurements		76	13	41	22		
Product 4. Tributary Water Quality Sampling							
Monthly Base Flow Samples							
Storm Events		8		6	2		
Spring Snowmelt		8	8				
Product 5. QA/QC							
In-Lake Field Replicates							
In-Lake Blank Sample		5	2	2	1		
Tributary Field Replicates		3	1	1	1		
Tributary Blank Samples		3	1	1	1		
Product 6. AnnAGNPS							
Identify and collect data on afo							
Identify critical cells in watershed							
Objective 2.							
Product 7. Direct Personal Contact							
Pre-Assessment Meeting		1			1		
Britton Winter Festival Show		1	1				
Post Assessment Meeting		1				1	
Product 8. Project Web Site							
Roy Lake Assessment Page							
Site "Hits"		15/month	60	60	60	45	
Product 9. News Releases							
News Articles							
Objective 3.							
Product 10. Reporting							
GRTS Semi-Annual Report (only if behind schedule)		2			1		
GRTS Annual Report		2	1			1	
Monthly Progress/Financial Reports (Day, Marshall CD)		28	6	6	6	4	
Payment Vouchers		16	4	4	4		
Final Project Report		1				1	

**Part 2 Funding****Section 319 Federal Budget**

	2008	2009	Total Costs	Fee Funds (40%)	319 Funds (60%)
<b>Administrative</b>					
Project Coordinator (16 hours per week)	\$ 5,338.00	\$ 16,013.00	\$ 21,351.00	\$ 8,540.40	\$ 12,810.60
Conservation Technician (12 hours per week)	\$ 3,628.00	\$ 7,256.00	\$ 10,884.00	\$ 4,353.60	\$ 6,530.40
Travel	\$ 540.00	\$ 1,080.00	\$ 1,620.00	\$ 648.00	\$ 972.00
<b>Subtotal</b>	<b>\$ 9,506.00</b>	<b>\$ 24,349.00</b>	<b>\$ 33,855.00</b>	<b>\$ 13,542.00</b>	<b>\$ 20,313.00</b>
<b>Objective 1 - Water Quality Sampling</b>					
In-Lake Water Quality Analysis	\$ 2,272.00	\$ 7,530.00	\$ 9,802.00	\$ 3,920.80	\$ 5,881.20
Macrophyte Survey	Cost associated in Administrative section.				
Tributary Stage and Flow	Cost associated in Administrative section.				
Tributary Water Quality Analysis	\$ 886.00	\$ 4,367.00	\$ 5,253.00	\$ 2,101.20	\$ 3,151.80
QA/QC	\$ 365.00	\$ 2,435.00	\$ 2,800.00	\$ 1,120.00	\$ 1,680.00
AnnAGNPS	Cost associated in Administrative section.				
<b>Subtotal</b>	<b>\$ 3,523.00</b>	<b>\$ 14,332.00</b>	<b>\$ 17,855.00</b>	<b>\$ 7,142.00</b>	<b>\$ 10,713.00</b>
<b>Objective 2 - Public Outreach</b>					
Direct Personal Contact	Cost associated in Administrative section.				
Project Web Site	Cost associated in Administrative section.				
New Releases	Cost associated in Administrative section.				
<b>Objective 3 - Project Evaluation, Reporting</b>					
Reports	Cost associated in Administrative section.				
<b>TOTALS</b>	<b>\$ 13,029.00</b>	<b>\$ 38,681.00</b>	<b>\$ 51,710.00</b>	<b>\$ 20,684.00</b>	<b>\$ 31,026.00</b>